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GB 2286946 A EP 0519795 A1 EP 0459279 A1
EP 0418165 A1 US 4841561 A

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(54) Abstract Title

A method and apparatus for configuring a modem for use in different countries

(57) A modem is able to operate in different telecommunications networks, and stores required operating parameters for such use. The modem obtains location information, for determining the operating parameters which are required, by sending a signal to a mobile telephone network, and interpreting a received reply signal to identify the network, and hence its location. The modem may be connected to a mobile telephone to send the signal to the mobile telephone network.

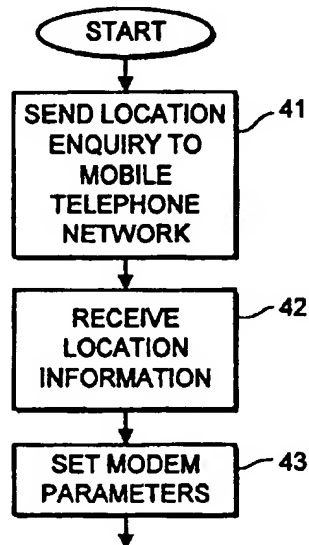
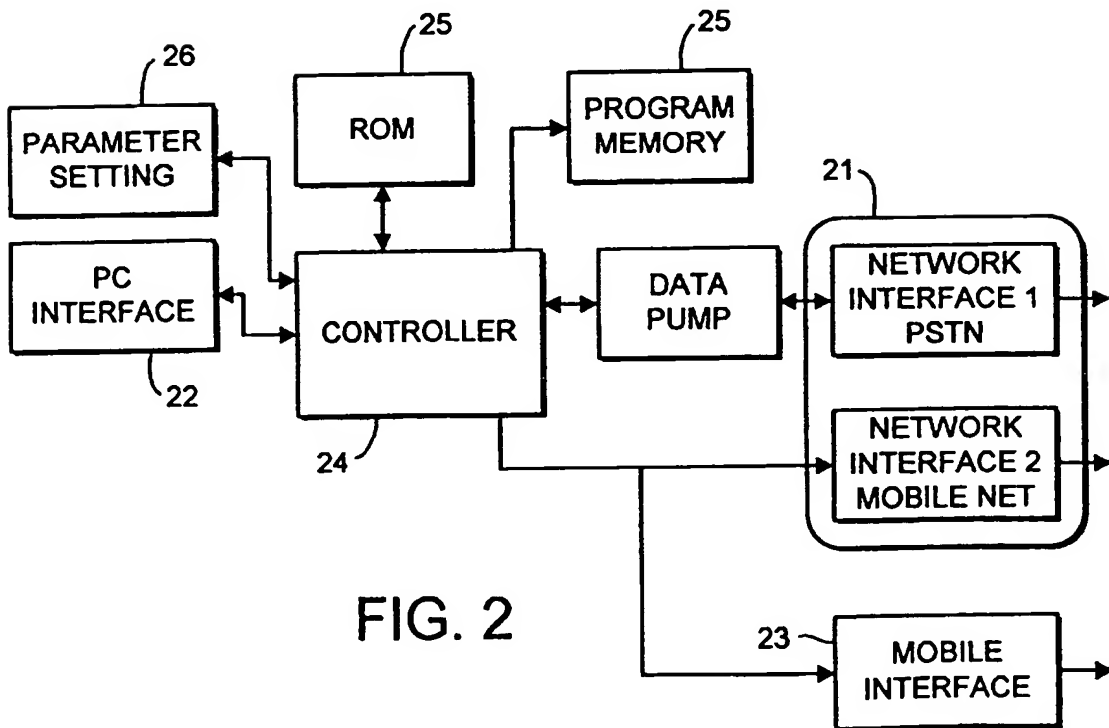
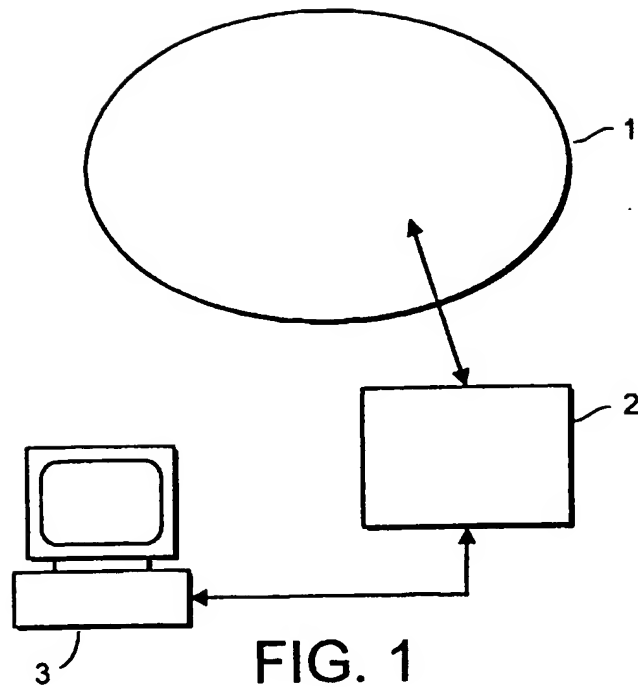


FIG. 4

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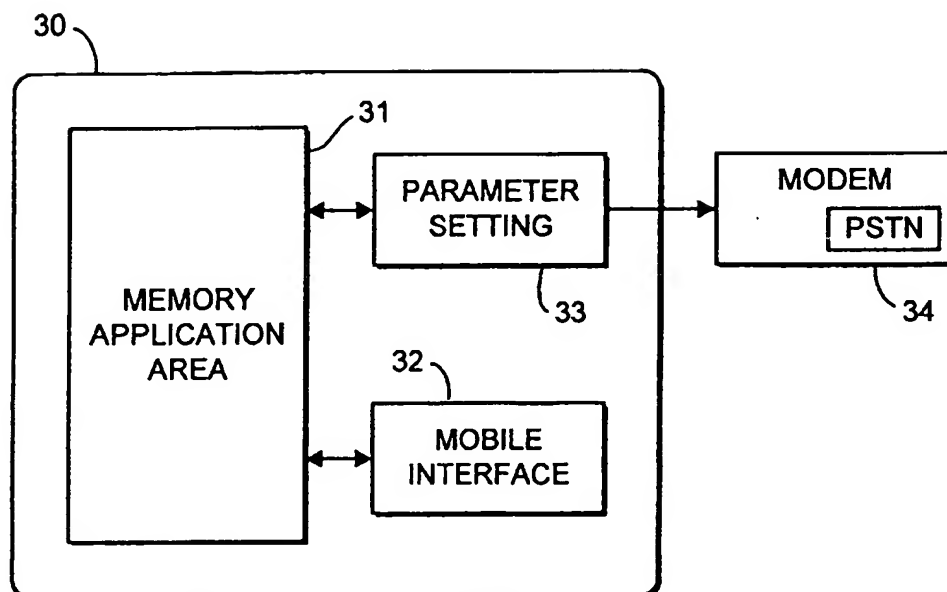


FIG. 3

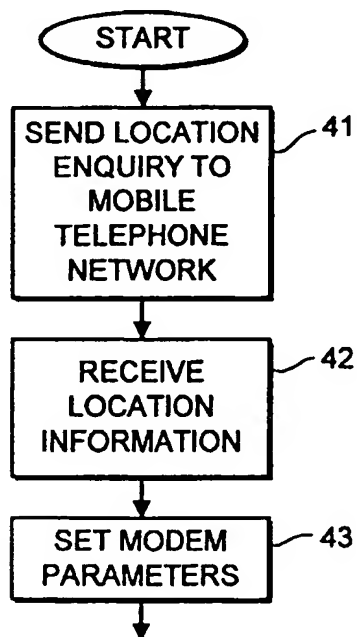


FIG. 4

MODEMSTECHNICAL FIELD OF THE INVENTION

The present invention relates to modems, and in particular to modems for connection to telecommunications networks.

DESCRIPTION OF THE RELATED ART

Modems are devices for connecting computers to telecommunications networks. Generally speaking, different countries have different standards for land telephony systems, and hence for modems which are to be connected thereto. For example line impedances, voltages, and pulse dialling methods used in the systems differ from country to country. Each modem therefore has to be verified by the telecommunications provider in each country for type approval.

Modems are often made "global" to lower the cost of manufacture by standardising parts and to enable the user to use the modem in most countries of the world.

US Patent No. 4,841,561, discloses a modem which includes a ROM, in which parameter values are stored for a plurality of countries. The user enters the relevant country code on start up of the modem and the appropriate parameters are then stored in non-volatile RAM for access. The country codes can be reset and re-entered as required.

However, for this modem to operate correctly, the user must understand how to enter the correct commands. This can lead to unsatisfactory use of the modem, since the set up may not be performed correctly. Moreover, a modem which has not been set up correctly may not meet the regulations set by the telecommunications provider, and may disturb the telecommunications network.

US Patent No. 4,868,863 describes a system in which standard modem hardware is connected to the telephone lines in a particular country by way of country dependent couplers. The appropriate coupler

for a country automatically converts the signals into a form suitable for transmission over that country's telephone network, by matching to the required voltages and impedances.

5 However, a user will often need to purchase a new coupler whenever travelling to a new country, thus making this an expensive solution.

SUMMARY OF THE PRESENT INVENTION

10 The present invention seeks to overcome the disadvantages associated with the prior art, by providing a modem which can automatically set the correct operating parameters, having determined its location by interrogating a mobile phone.

15 A mobile phone needs to know where it is located in order to operate. Moreover, it is able to obtain this information by transmitting signals to, and receiving signals from, base stations within a mobile communications network. This information can be used by a modem to ensure that it sets its own operating
20 parameters based on the information received from the mobile phone.

 According to a preferred embodiment of the present invention, there is provided a modem for connection to a telecommunications network, the modem comprising
25 means for connecting the modem to a mobile telephone network, means for receiving location information from the mobile telephone network, and means for setting modem parameters based on the received location information.

30 According to a preferred embodiment of a second aspect of the present invention there is provided a method of operating a modem comprising steps of establishing a connection to a mobile telephone network, obtaining location information from the mobile
35 telephone network, and setting modem parameters on the basis of the received location information.

The location information can identify the country in which the mobile telephone network is located, or can identify the mobile telephone network itself.

5 In either case, the modem is able to determine the appropriate parameters based on the location information.

10 The modem parameters can be set by and in the modem itself, or may be set by a personal computer (PC) application program. Such an application program can receive the location information and set its parameters appropriately.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 shows a schematic view of a modem connecting a computer to a telecommunications network;

15 Figure 2 shows a block schematic diagram of a modem embodying the present invention;

Figure 3 shows a block diagram of a system embodying the present invention; and

20 Figure 4 is a flow chart showing steps in a method embodying the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

As shown in Figure 1, a modem 2 is used to connect a computer 3 to a telecommunications network 1. As explained above, since different countries have different telecommunications network requirements, a modem is required which can be easily and simply configured to interact correctly with the telecommunications network of the country concerned.

30 Figure 2 shows a modem 2 which includes a network interface 21 for connection to the desired telecommunications network, and a computer interface 22 for connection to the computer such as a PC 3 (Figure 1). As is conventional, the network interface 21 and computer interface 22 are connected together, for the transfer of data therebetween.

35 In addition, the modem 2 comprises a mobile

interface 23 for connection to a mobile telephone, and a controller 24 connected to the mobile interface 23 to send signals thereto and to receive information therefrom. The controller 24 is connected to supply signals to a ROM 25 (or other memory) to control the supply of stored information therefrom to a parameter setting circuit 26.

As is conventional, the ROM 25 may store appropriate operating parameters for a wide range of countries. In accordance with the invention, however, the parameters supplied to the parameter setting circuit are determined not by the user of the device, but by the controller 24, based on information which it receives.

The parameter setting circuit 26 operates to control the network interface 21 to set the operating parameters of the modem, and hence the properties of the signals supplied to the telecommunications network 1, in order that the network connection means 21 can interact correctly therewith.

The mobile interface 23 operates to connect the modem to a mobile telephone, and hence to a mobile telephone network. Figure 3 illustrates a personal computer (PC)/modem system embodying the present invention. The PC 30 is connected to a modem 34, and includes a memory/application area 31, a parameter setting function 33 and a mobile interface 32. The mobile interface 32 can be connected to a mobile telephone, or could itself include all the apparatus required to interface to a mobile telephone network.

The parameter setting function 33 operates to set the modem parameter values from the PC 3. The system of Figure 3 operates in the same manner as the modem of Figure 2, the only change being that functional items are distributed differently.

The operation of the apparatus of Figures 2 and 3

will now be described with reference to Figure 4.

As illustrated in Figure 4, at step 41, the mobile telephone connection means interrogates the mobile telephone network in order to obtain (step 42) information relating to the network within which the phone is operating. The controller 24 within the modem is able to convert this information into location information of the modem.

The location information obtained by the mobile interface can be information relating specifically to the country in which the mobile telephone network is located, or may merely identify the mobile telephone network to which the modem is connected, with the controller 24 then being able to determine the country from this information.

For example, in a GSM system, and other digital systems, each network operator has a specific code. The controller 24 can then determine the network operator and country from this code by referring to prestored information.

The modem is described above as having a network interface which connects to a PSTN landline telephone network. However, it will be appreciated that the network interface may allow connection of the modem to a mobile telecommunications network.

This location information is used by the controller 24 to determine which set of stored operating parameters should be used, based on the country in which the modem is being used, and the controller sends a signal to the ROM 25 (step 43) to send the relevant parameters to the parameter setting circuit 26.

In the preferred embodiment of the invention, the mobile interface 23 makes a physical connection with a mobile telephone, and enquires of the telephone about network and/or country information. The mobile

telephone obtains such information by sending a radio signal to the network within which it is operating. The information can be obtained in response to a specific request from the modem, but is more usually
5 obtained by the telephone as soon as it connects to the mobile telephone network.

Where the modem is wireless, that is, the network interface allows connection of the modem to a mobile network, there may be no need for a separate mobile
10 interface. The controller 24 may direct that a radio signal is sent from the network interface to a network within which the device is operating, to obtain the necessary location information.

The ROM 25 preferably stores parameters
15 appropriate for a first country data as default country data. This default country data would usually be the home country of the user of the modem, and may be identified by the modem as the parameters obtained when the controller first obtains information from the
20 mobile interface 23. Any updated information relating to other countries can be supplied to the parameter setting circuit on a temporary basis, so that for example when the power has been turned off the modem reverts to home country parameter settings.
25 Alternatively, the modem may automatically revert to home country settings after a certain period of time, or by using a specific command on the PC.

When the modem is connected to a mobile phone to obtain the required location information, it may, by
30 sending an appropriate signal over the mobile interface 23, use the phone display or ringer to indicate that a change of country parameter setting has been made.

Such a modem has the significant advantage that the modem itself can determine in which country it is
35 operating and therefore which parameter settings are required. The system is therefore simple and easy to

operate.

The country information received by the modem from the mobile phone can also be used to control a PC application, such as an International Internet Service Provider. The application receives the country information from the modem (or from the mobile phone directly), and uses it to set country specific parameters in the PC application. For example, these parameters can be:

- 10 - phone number to dial for local modem pool (e.g. for lowest cost per minute)
- language
- whether or not to include the national code in the phone number
- 15 - which Internet server to use, and possible more.

CLAIMS

1. A modem for connection to a telecommunications network, the modem comprising:

5 means for connecting the modem to a mobile telephone network;
means for receiving location information from the mobile telephone network; and
means for setting modem parameters based on the received location information.

10 2. A modem as claimed in claim 1, wherein the location information identifies the country in which the mobile telephone network is located.

15 3. A modem as claimed in claim 1, wherein the location information identifies the mobile telephone network.

4. A modem as claimed in claim 1, 2 or 3, further comprising means for connecting the modem to a computer, and means for connecting the modem to a telecommunications network, the modem being operable to
20 connect the computer to the telephone communications network.

5. A modem as claimed in claim 1, comprising means for connection to a mobile telephone to obtain the connection to the mobile telephone network.

25 6. A method of operating a modem comprising the steps of:

establishing a connection to a mobile telephone network;

30 obtaining location information from the mobile telephone network; and

setting modem parameters on the basis of the received location information.

35 7. A method as claimed in claim 6, wherein the connection to a mobile telephone network is achieved through a mobile telephone.

8. A modem, having desired operating parameters

determined by a location of use thereof, the modem comprising:

means for sending an interrogation signal to a mobile telephone network;

5 means for interpreting a reply signal received from the mobile telephone network to determine the location thereof; and

means for setting the operating parameters thereof based on the location determined thereby.

10 9. A modem as claimed in claim 8, comprising means for storing a set of default operating parameters thereof based on the location determined by the first reply signal received from a mobile telephone network.

15 10. A modem as claimed in claim 9, comprising means for using the set of default operating parameters after the modem has been switched off and before the operating parameters thereof have been reset based on the location determined by interpreting a reply signal received from a mobile telephone network.

20 11. A modem as claimed in claim 9, comprising means for using the set of default operating parameters after a predetermined time has elapsed since the operating parameters thereof have been reset based on the location determined by interpreting a reply signal received from a mobile telephone.

25 12. A modem as claimed in claim 8, comprising means for connection to a mobile telephone to send the interrogation signal to a mobile telephone network.

30 13. A modem as claimed in claim 12, comprising means for sending a signal to the mobile telephone to activate an alerter therein following a determination that the location of the modem has changed.

35 14. A modem as claimed in claim 13, comprising means for sending a signal to the mobile telephone to activate a display therein.

15. A modem as claimed in claim 13, comprising

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means for sending a signal to the mobile telephone to
activate a ringer therein.



The Patent Office

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Examiner: Peter Slater
Date of search: 11 February 1998

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): H4K (KOD5); H4L (LDA)

Int Cl (Ed.6): H04M 11/06

Other: ONLINE: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	GB 2286946 A (INTEL)	1,6 & 8
A	EP 0519795 A1 (APPLE)	1,6 & 8
A	EP 0459279 A1 (HAYES MICROCOMPUTER)	1,6 & 8
A	EP 0418165 A1 (APPLE)	1,6 & 8
A	US 4841561 A (GENERAL DATACOMM)	1,6 & 8

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.